REMARKS

Applicants and the undersigned are most grateful for the time and effort accorded the instant application by the Examiner. Applicants received a final Office Action dated February 24, 2006. Applicants submitted an Amendment After Final and received an Advisory Action from the Office. In response to the Advisory Action, Applicants are now submitting an Amendment along with a Request for Continued Examination. The Office is respectfully requested to reconsider the rejections presented in the outstanding Office Action in light of the following remarks.

Claims 1-25 were pending in the instant application at the time of the outstanding Office Action. Of these claims, Claims 1, 13 and 25 are independent claims; the remaining claims are dependent claims. Claims 1, 13, and 25 have been rewritten. Applicants intend no change in the scope of the claims by the changes made by this amendment. It should be noted this amendment is not in acquiescence of the Office's position on allowability of the claims, but merely to expedite prosecution.

Claims 1, 13, and 25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Richardson et al. (hereinafter "Richardson"). Claims 2, 6-12, 14, and 18-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Richardson in view of Kita et al. (hereinafter "Kita"). Claims 3, 4, 15, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Richardson in view of Kita, and further in view of Miller et al. (hereinafter "Miller"). In light of the following remarks, reconsideration and withdrawal of the present rejections is hereby respectfully requested. It should also be

noted, the comments made regarding the present invention in Applicants' previous Amendments remain equally applicable and are, therefore, incorporated by reference as if fully set forth herein.

As indicated in Applicants' disclosure, when test data for a parser is different in nature than the data on which the parser was trained, the performance of a parser will become worse than that of a matched condition. The present invention thus broadly contemplates adapting statistical parsers to new data. In particular, it is assumed that an initial statistical parser is available and a batch of new data is given. In unsupervised adaptation, however, true parses of the new data are not available. The initial model preferably includes a finite collection of probability mass functions (pmf's). The pmf's are preferably transformed into a new model via Markov matrices. These Markov matrices are preferably obtained by maximizing the likelihood of test data with respect to the decoded parses using the initial model. In broad terms, the present invention relates to the adapting of an existing statistical parser into one that fits better new or unseen text data. The adaptation scheme may also be carried out iteratively. (See Page 3, line 15 - Page 4, line 7) Further, the instant invention enables both supervised and unsupervised adaptation, in which the inputs the instant invention differ. (See Page 6, lines 7-15) Thus, along with specifically requiring "**adapting the statistical [parsing] model** via employing a mathematical transform", the claim limitations also require "a statistical model **which is able to decode more than one type of input.**" (Claim 1, emphasis added) Similar language appears in the other independent claims.

As best understood, in contrast to the present invention, Richardson appears to be directed to a method and apparatus for bootstrapping statistical processing into a rule-based natural language processor. This bootstrapping optimizes the operating of a parse that uses lexicon entries to determine possible parts of speech of words and a set of rules to combine words from the input string into syntactic structures. (Abstract) As asserted in previous Amendments, Richardson does not teach or suggest adapting a stasticial model by employing a mathematical transform. It is respectfully asserted that Richardson further is not capable of handling more than one type of input. Specifically, Richardson refers to plain-text sentences as input, and never offers or suggests any other type of input that could be used by his invention. It is thus respectfully submitted that Richardson falls short of the present invention.

Applicants respectfully submit that the applied art does not anticipate the present invention because, at the very least, "[a]nticipation requires the disclosure in a single prior art reference of each element of the claim under construction." W.L. Gore & Associates, Inc. v. Garlock, 721 F.2d 1540, 1554 (Fed. Cir. 1983); see also In re Marshall, 198 U.S.P.Q. 344, 346 (C.C.P.A. 1978).

The Office also rejected certain claims under 35 U.S.C. § 103(a) over Richardson in combination with various references, asserting "it would have been obvious ... to combine the parsing system of Richardson et al. with the Markov calculations as taught by Kita et al." and "it would have been obvious ... [to] combine the parsing system of Richardson et al. with the Markov calculations as taught by Kita et al. and with the

probability mass functions of Miller et al.". Applicants respectfully traverse these rejections.

Kita in combination with Richardson does not overcome the deficiencies of Richardson as discussed above. Neither Richardson nor Kita suggest "adapting the statistic parsing model via employing a mathematical transform". (Claim 1, and other independent claims) Further, neither Richardson nor Kita suggest "a statistical model which is able to decode more than one type of input". As best understood, Kita is directed towards continuous speech recognition. Kita refers to experimentation of his invention, in which he discusses a single input (phrases uttered by a male model) that was used. There is no suggestion or teaching in Kita pertaining to a statistical model that would be able to decode more than one type of input.

A 35 U.S.C. § 103(a) rejection requires that the combined cited references teach all of the limitations of the claimed invention and provide both the motivation to combine the references and an expectation of success. As shown above, the combination of the two references fails to teach all of the limitations of the claimed invention. Moreover, it is respectfully submitted that there is absolutely no motivation to combine Richardson with Kita.

The outstanding Office Action asserts that the two references should be combined to increase recognition accuracy. However, Richardson does not deal with speech recognition. Richardson deals solely with natural language processing and parsing. There is no mention of recognition or of utilizing HMMs in Richardson. Further,

Richardson does not even utilize the same type of input as Kita into their respective inventions. Both the input and the output of their inventions differ, as do the aims of each invention. Richardson works with text-based parsing and processing, whereas Kita attempts to recognize the spoken word. The processing necessary for each of these tasks is well-known in the art to be separate and distinct, and clearly could not be combined to make the other more efficient. Thus, it is respectfully submitted that there is a clear lack of motivation for the combination of these two references.

Further, with regards to the claimed limitations, neither Kita nor Richardson address improving an existing statistical parser when applied to newly acquired data by mathematically transforming the existing model. The present invention does not involve Hidden Markov Models (HMM), instead it uses a Markov transform, which is not an equivalent process or function. HMMs have an underlying Markov chain with probability functions associated with either states or transitions. Because HMMs are not used in the present invention, the algorithm estimating or updating HMM parameters in Kita doses not apply to the present invention. Appreciating the fact that HMMs are distinctively different from the present mathematical transform, it is respectfully submitted that it is clear the rejections using this reference are without support and should be withdrawn.

Additionally, the Applicant would like to make several other points regarding the present rejections. With regard to claims 2 and 14, as indicated above, the present invention does not use nor claim to use HMMs. Therefore, Kita does not teach or suggest these claims and their rejections should be withdrawn. Per the rejections of claims 6 and

18, as indicated above, Kita, as best understood, uses a well-known technique for estimating HMM parameters, while the present invention, in at least one embodiment, is related to a novel technique for adapting an existing statistical parser to new data. In particular, Kita finds the most optimal probabilities to predict the next phone while parsing. Upon reaching the best probability point, Kita stops the process of parsing.

With regard to Claims 6 and 18, the combination of references does not meet the limitations of the claims in contention. The instant invention, as exemplified in Claims 6 and 18, approaches maximization of the log probabilities in the Markov transform in a much different and distinct fashion. Specifically, the instant invention chooses a Markov matrix such that the log probability of either the decoded parses of test material or adaptation material is maximized. As can be seen, this is separate and distinct from the parsing method of Kita. Further, Kita does not even utilize Markov matrices in this function; rather, Kita finds these "best" and "highest" probabilities while parsing using a parsing tree (which is known to be separate from a Markov matrix).

With respect to claims 7, 9, 19, and 21, it is respectfully submitted that neither Richardson, nor the combination of Richardson with Kita, teaches both supervised or unsupervised adaptation as claimed in the instant invention. The outstanding Office Action asserts that Kita teaches the use of the Viterbi algorithm to update the probabilities. However, it is well-known in the art that the Viterbi algorithm does not explicitly require supervised and/or unsupervised adaptation. As is well-known in the art, the Viterbi algorithm is used to find the most probable sequence of hidden states given a sequence of observed states for a particular Hidden Markov Model. This has no effect on

how the adaptation of data utilizing the HMM is carried out, nor does it require or limit how such adaptation is done. Thus, it is respectfully submitted that using the Viterbi algorithm has no effect on supervised or unsupervised adaptation as taught and claimed in the instant invention. Further, because neither Richardson, Kita, nor the combination of the two, teach supervised or unsupervised adaptation, the rejection with respect to Claims 7, 9, 19, and 21 is respectfully requested to be reconsidered and withdrawn. These claims are respectfully submitted to be allowable over the prior art.

Claims 8 and 20 depend upon Claims 7 and 19. Because Claims 7 and 19 are deemed to be allowable over the prior art, it follows that Claims 8 and 20 would also be allowable subject matter. Thus, the rejection of these claims is also respectfully requested to be reconsidered and withdrawn.

Regarding the rejections of claims 11 and 23, while Richardson addresses decoding test material it fails to teach or suggest decoding for the purpose of adapting an existing parser to new data and/or decoding within a method or process comprising constructing an initial parser and then applying the proposed adaptation technique. As to the rejection of claims 10 and 22, "an efficient parsing mode, where the parser only applies applicable rule and lexicon entries" fails to relate to adapting an existing model to new material. These rejections should now be withdrawn.

Miller et al. in combination with Richardson and Kita does not overcome the deficiencies of Richardson or Kita as discussed above. There is no teaching or suggestion in Miller of a statistical model which is able to decode more than one type of input.

Further, the combination of these references is also not technically valid, as shown above with respect to Richardson and Kita. A 35 U.S.C. § 103(a) rejection requires that the combined cited references provide both the motivation to combine the references and an expectation of success. Therefore, it is respectfully submitted that the rejections based upon the combination of Miller with Richardson and Kita are not valid rejections. Reconsideration and withdrawal is respectfully requested. The Applicants would like to also note that none of these references, including Miller, address the process of transforming an original probability mass function into another, since it must be understood that there are two (2) probability mass functions, one occurring before and one occurring after adaptation. Furthermore, whether the probability mass function is written as a row or column vector is secondary to the novelty of the use of a mathematical transform as presently included in the claims.

By virtue of dependence from what are believed to be allowable independent Claims 1 and 13, it is respectfully submitted that Claims 2-12 and 14-24 are also presently allowable. Applicants acknowledge that Claims 5 and 17 were indicated by the Examiner as being allowable if rewritten in independent form. Applicants reserve the right to file new claims of such scope at a later date that would still, at that point, presumably be allowable.

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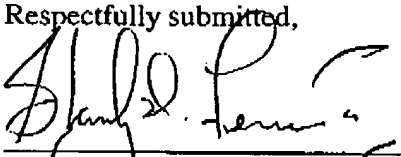
In summary, it is respectfully submitted that the instant application, including Claims 1-25, is presently in condition for allowance. Notice to the effect is earnestly solicited. If there are any further issues in this application, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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